

PARALLEL PROCESSING SYSTEM DESIGN AND ARCHITECTURE

ABSTRACT : An architecture and design called Resource control programming (RCP), for automating the development of multithreaded applications for computing machines equipped with multiple symmetrical processors and shared memory. The Rcp runtime (0102) provides a special class of configurable software device called Rcp Gate (0600), for managing the inputs and outputs and user functions with a predefined signature called node functions (0500). Each Rcp gate manages one node function, and each node function can have one or more invocations. The inputs and outputs of the node functions are virtualized by means of virtual queues and the real queues are bound to the node function invocations, during execution. Each Rcp gate computes its efficiency during execution, which determines the efficiency at which the node function invocations are running. The Rcp Gate will schedule more node function invocations or throttle the scheduling of the node functions depending on the efficiency of the Rcp gate. Thus automatic load balancing of the node functions is provided without any prior knowledge of the load of the node functions and without computing the time taken by each of the node functions.